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AMSAT NEWS SERVICE
ANS-141

ANS is a free, weekly, news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org

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ANS-141 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 141.01
>From AMSAT HQ SILVER SPRING, MD.
May 20, 2012
To All RADIO AMATEURS
BID: $ANS-141.01

AMSAT Satellite Education Focus at Dayton

This weekend marked the annual Dayton Hamvention. AMSAT was present and active inside at the booth in the Ball Arena of the Hara Center and outside at the Satellite Demonstration area. AMSAT Vice President for Educational Relations Mark Hammond, N8MH said, "This year, we had a focus on trying to get youth and first time operators ON THE AIR!" The Satellite Demonstration area gave students, educators, and first time hams the opportunity to come to the microphone and make a satellite contact. Between passes equipment and experienced operators were available for discussions and answers to questions. Differences in operating techniques between FM and linear satellites were demonstrated. Also differing levels of equipment ranging between very simple and portable stations to a full station with computer control were operating.

Dayton also gave AMSAT and ARRL the opportunity to recruit new ARISS (Amateur Radio on the International Space Station) Technical Mentors and Ground Station Operators. Mark, N8MH took advantage of the ARRL Stage on Friday and Saturday to explain the roles of ARISS Technical Mentors who serve as an advising and coordinating liaison between NASA, the school or group making the ARISS contact, and the Ground Station Operators, who set up the satellite station at the contact

location.

The AMSAT Forum at Dayton, moderated by Alan Biddle, WA4SCA also included Mark's presentation on the current and future education work. He described specific needs, especially in area of writing K-12 lesson plans (in science and math) using amateur satellite telemetry. Educators who are satellite operators should contact him directly at n8mh@amsat.org and are encouraged to join the AMSAT-EDU mailing list to learn how they can help with our educational outreach. (See: http://www.amsat.org/mailman/listinfo to join AMSAT-EDU.)

AMSAT's university level mentorship of CubeSat development projects was presented by Alex Harvilchuck, N3NP as he discussed CubeSats at Pennsylvania State University-Erie.

Also, at the AMSAT Forum, AMSAT Engineering VP, Tony Monteiro, AA2TX discussed Project Fox - AMSAT's First CubeSat which was accepted for launch by Project ELaNa, NASA's "Educational Launch of NanoSat". Fox-1 was selected to join the NASA ELaNa program on merit in support of NASA strategic and educational goals. The "Running With Fox" theme at the AMSAT booth featured a model of the Fox-1 cubesat.

[ANS thanks Gould Smith, WA4SXM, and Mark Hammond, N8MH for the above information]

Reminder - One Month to Field Day - AMSAT FD Rules On-Line

AMSAT Director Contests and Awards, Bruce Paige, KK5DO reminds you that time of year is once again approaching - Field Day!

Each year the American Radio Relay League (ARRL) sponsors Field Day as an emergency preparedness exercise. The event takes place during a 24-hour period on the fourth weekend of June. For 2012 the event takes place during a 27-hour period between 1800 UTC on Saturday, June 23, 2012 and 2100 UTC on Sunday June 24, 2012. Those who set up prior to 1800 UTC on June 23 can operate only 24 hours.

The Radio Amateur Satellite Corporation (AMSAT) promotes its own version of Field Day for operation via the amateur satellites, held concurrently with the ARRL event.

With the loss of AO-51 and SO-6ay this y ear is going to be most challenging. If you are considering ONLY the FM voice satellites like AMRAD-OSCAR-27 or SaudiSat-Oscar-50 for your primary AMSAT Field Day focus: Don't, unless you are simply hoping to make one contact for the ARRL rules bonus points.

The congestion on FM LEO satellites was so intense in prior years that we must continue to limit their use to one-QSO-per-FM-satellite. This includes the International Space Station. You will be allowed one QSO if the ISS is operating Voice. You will also be allowed one digital QSO with the ISS or any other digital, non-store-and-forward, packet satellite (if operational).

If you have worked the satellites on Field Day in recent years, you may have noticed a lot of good contacts can be made on some of the less-populated, low-earth-orbit satellites like VUSat OSCAR-52,Fuji-OSCAR 29 (may or may not be operational), AMSAT-OSCAR 7. During Field Day the transponders come alive like 20 meters on a weekend. The good news is that the transponders on these satellites will support multi-

ple simultaneous contacts. The bad news is that you can't use FM,
just low duty cycle modes like SSB and CW.

The AMSAT Field Day 2012 event is open to all Amateur Radio operators.
Amateurs are to use the exchange as specified in ARRL rules for Field
Day. The AMSAT competition is to encourage the use of all amateur sat-
ellites, both analog and digital.

For the complete listing of the AMSAT Field Day Rules please refer to
the documents posted on-line at:
http://www.amsatnet.com/fd2012.doc
http://www.amsatnet.com/fd2012.pdf
Links are also accessible from http://www.amsat.org front page.

[ANS thanks AMSAT Director Contests and Awards, Bruce Paige, KK5DO
 for the above information]

Japan Amateur Radio CubeSat Launch May 17 - Telemetry on 437.375 MHz

The May 17 launch from Japan of the H-IIA rocket delivered a JAXA
climate observation satellite SHIZUKU (GCOM-W) and a South Korean
earth observation mission KOMPSAT-3 into orbit also launched an
amateur radio satellite HORYU-2, built by students at the Kyushu
Institute of Technology (KIT).

The HORYU-2 Cubesat includes several experiments:
+ 300 volt power generation in LEO
+ COTS technology demonstration of surface potential measurement
+ Orbital debris observation
+ Earth photography

The satellite callsign is JG6YBW and radio amateurs are asked to
listen for the 437.375 MHz telemetry downlink. The CW data is com-
posed of an 11 character callsign "JG6YBW HORYU" followed by 15
characters of telemetry data. Details of the telemetry format are
available via a link on the AMSAT-UK web, see:
http://www.uk.amsat.org/7404

More information is available on the web:
Horyu website in Google English: http://tinyurl.com/HoryuSatellite
http://www.uk.amsat.org/6638
http://www.uk.amsat.org/4279
http://www.uk.amsat.org/7404
http://www.uk.amsat.org/7540 (showing Horyu-2 separation on-orbit)

Initial TLE set can be found on-line at:
http://kitsat.ele.kyutech.ac.jp/Documents/ground_station/TLE.txt

The 437.375 MHz telemetry downlink also transmits 1200 bps AX.25
packet radio. There is a monthly competition for those who send
data received from the telemetry to the KIT server, via the HORYU-2
telemetry analysis software which can be downloaded from:
http://kitsat.ele.kyutech.ac.jp/Documents/information_launch_english.html

Day 1 Initial Reception Reports

The CW signal from HORYU-2 was copied in South America by LW2DTZ on
437.375 MHz on May 17 on a 10 degree elevation pass using 7 element
yagi antenna. A strong downlink CW beacon signal was heard in Sudan
by ST2NH. GW1FKY reported a strong signal was heard in Wales, UK.

JE9PEL captured downlink telemetry from Japan.

[ANS thanks the Horyu-2 team and AMSAT-UK for the above information]

Three Hams Arrive at ISS & Prepare for SpaceX Dragon Arrival

The three crew members who are licensed amateur radio operators were successfully launched on Monday aboard a Russian Soyuz TMA-04M space craft from the Baikonur Cosmodrome in Kazakhstan and have arrived at the International Space Station. The three ham crew consists of NASA Flight Engineer Joseph Acaba, KE5DAR, and two Russian crewmates, Soyuz Commander Gennady Padalka, RN3DT, and Flight Engineer Sergei Revin, RN3BS.

Their arrival brings the crew roster up to six as they join Expedition 31 Commander Oleg Kononenko, RN3DX, of the Russian Federal Space Agency, Flight Engineer Don Pettit, KD5MDT, of NASA and Flight Engineer Andrei Kuipers, PI9ISS, of the European Space Agency, who have been aboard the ISS since December 2011.

NASA reported on the events after arrival of the crew in their ISS On-Orbit Status report posted at: http://tinyurl.com/ISS-On-Orbit
The NASA ISS daily status report for May 18 notes that Joe, KE5DAR also powered on the ham radio station in the Russian Service Module.
A NASA video report of the ISS crew activities can be viewed at:
http://www.youtube.com/watch?feature=player_embedded&v=bA9PXqX_L4Y

The new crew members will begin preparations for the arrival of an unmanned Dragon cargo ship built by SpaceX. Originally scheduled for launch on May 19, a faulty check valve on an engine caused an abort. SpaceX is replacing the failed valve. The next launch attempt is at present planned for Tuesday, May 22 at 3:44 AM EDT (UTC-4).

Dragon will deliver about 1150 pounds of food, clothing and other low-priority items. The capsule then will be repacked with around 1455 pounds of trash and no-longer-needed components and detached from the space station on May 31. SpaceX plans to guide the craft back to Earth for a parachute descent to a Pacific Ocean splashdown to complete the test flight. If the test flight goes well, SpaceX hopes to begin routine cargo delivery missions in August, 2012.

The Dragon capsule will also deliver 15 student experiments from the Student Spaceflight Experiments Program (SSEP). See:
http://www.space-travel.com/reports/Space_Station_Here_We_Come_999.html

Soon after Dragon a Russian Progress vehicle will arrive. In July a Japanese HTV cargo ship will arrive. The crew will also be managing over 215 scientific investigations affecting over 400 scientists on the ground.

An on-line Expedition 31 Mission Status page can be found at:
http://spaceflightnow.com/station/exp31/status.html
For additional details of the Soyuz launch see:
http://spaceflightnow.com/station/exp31/120514launch/
Archived video of the Soyuz launch can be viewed on-line at:
http://www.universetoday.com/95174/expedition-31-blasts-off/

[ANS thanks SpaceFlightNow.com and UniverseToday.com for the above information]

CubeSat Article in Time Magazine

In an article titled, "How a Pocket-Size Satellite Could Find Another Earth", Time Magazine reports that unlike the massive NASA Kepler probe the next mission to search for new planets will be a tiny CubeSat called ExoplanetSat.

Time says: What makes ExoplanetSat even more un-NASA-like is that it began as a class project - although admittedly, the class was at MIT. It was a design-and-build course, which the university's engineering students have to take in order to graduate. In a recent semester, the class was co-taught by Sara Seager [KB1WTW] an astrophysicist who has done groundbreaking research studying how the atmospheres of planets orbiting distant stars might look like from earthly telescopes. Seager recruited five science undergrads to join her engineers, on the theory that out in the real world, they'd eventually have to work with engineers anyway.

The group is developing a prototype ExoplanetSat capable of monitoring a single, bright, sun-like star for two years. Planned to launch late 2012 or 2013 it is hoped it will open the gates for ExoplanetSat interest and funding. Once the funding doors are opened, then the fleet of ExoplanetSats can be launched. The fleet may contain as many as a hundred of these small satellites, each focused on its own star.

In a 2011 visit to Cambridge, UK, Sara said "The reason why we're excited is because we think that this is a really huge thing. Hundreds and thousands of years from now, people will look back and ask, what are the significant accomplishments of our society in the early twenty-first century? One of them will be that we were the first to discover other worlds and other worlds that might be like Earth. When you think back four hundred years, what do you remember? You think about Christopher Columbus and Lewis and Clark. It's the exploration-finding things that were new to our culture. And that's why we're excited."

Read the Times Magazine article at
http://www.time.com/time/health/article/0,8599,2114158,00.html

MIT paper on ExoplanetSat
http://dspace.mit.edu/openaccess-disseminate/1721.1/61644

AMSAT-UK article at: http://www.uk.amsat.org/7348

[ANS thanks AMSAT-UK for the above information]

Promising Future of CubeSat Missions in UK Metro Newspaper

The May 14, 2012 edition of the Metro newspaper carried a story by Ben Gilliland, "The next space age: Cuberty", on pages 26-27 about CubeSats. Among those mentioned is the UK amateur radio Android smartphone CubeSat STRaND-1 which is being built by volunteers at the Surrey Space Centre (SSC).

The online edition of the Metro newspaper can be read at:
http://e-edition.metro.co.uk/2012/05/14/
You will be prompted for an email address but anything that looks like an email address will keep the prompt happy and you can then read the newspaper.

Ben Gilliland's article is also available on the CosmOnline website at: http://www.cosmonline.co.uk/blog/2012/05/14/next-space-age-cuberty

See also: http://www.uk.amsat.org/7395

[ANS thanks Trevor, M5AKA and AMSAT-UK for the above information]

Satellite Shorts From All Over

+ It is time to submit nominations for the upcoming open seats on the AMSAT-NA Board of Directors. Three directors and two alternate directors have terms expiring this year. The director seats open for election are held by Tom Clark, K3IO; Lou McFadin, W5DID; and Gould Smith, WA4SXM. The alternate director seats open for election are held by Mark Hammond, N8MH and Patrick Stoddard, WD9EWK. The AMSAT front page news at http://www.amsat.org has the instructions to submit your nominations.

+ The 2012 AMSAT Annual Meeting and Symposium will be held at the Holiday Inn, Orlando (Florida) Airport on October 26-28, 2012. The First Call for Papers has been issued. The Symposium Team requests a tentative title of your presentation as soon as possible, with final copy to be submitted by October 1 for inclusion in the printed proceedings. Abstracts and papers should be sent to Dan Schultz, N8FGV, at n8fgv at amsat.org. Watch for the latest 2012 Symposium information to be posted on the AMSAT web at: http://www.amsat.org/amsat-new/symposium/2012/index.php

+ While the AMSAT on-line store is closed due to technical issues you can place an order through the AMSAT office. The hours are 10:00 AM - 6:00 PM EDT. Our phone number is 301-589-6062. Martha is looking forward to hearing from you!

+ Clint Bradford, K6LCS and Rich Arland K7SZ collaborated on an article, "Learning Curve - Working the Birds" which was just published in the May, 2012 Dayton Special issue of CQ magazine.

+ The future plans of the QB50 network of 50 CubeSats in a 'string-of-pearls' configuration that will be launched together in the first half of 2015 by a single rocket has caught the attention of the press. The UK Daily Mail published an article how the network of 50 satellites aims to find out what happens INSIDE the northern lights and hopefully 'forecast' solar weather.
See: http://tinyurl.com/UKMail-QB50

+ A Video showing a time lapse view of Earth's Northern Hemisphere from Russia's Electro-L Weather Satellite is posted at: http://www.spaceref.com/news/viewsr.html?pid=40807

+ Two videos, one of the Aalto-1, about Finland's first satellite project, showing their new groundstation and an animation of the mission is posted on the AMSAT-UK web at: http://www.uk.amsat.org/7371

+ Though likely no operation on amateur radio satellites at this time, the re-planned TX5, Clipperton Island DXpedition has a plan to utilize satellites. The Cordell Expeditions is pleased to announce a DXpedition to Clipperton Island in early 2013. The team of 24 will sail from San Diego on February 19, 2013, and will be active from Clipperton for 10 days starting around March 1. They will be active on all bands and all modes, and will use DXA, the satellite-linked system that displays near-real-time log data on any Web browser. They state, "We invite your participation in this project, as a team member, supporter, or callsign in our log!" Clipperton Island Web page: http://www.cordell.org/CI/index.html Details of DXA satellite program: http://www.cordell.org/DXA/ The DXA program is also planned to be used on a Cordell Expeditions trip to VK0H, Heard Island in early 2014. (via Ohio/Penn DX Bulletin #1062, and #1062.2)

+ 51 years ago on May 5, 1961, NASA launched the Mercury-Redstone 3 rocket carrying Alan B. Shepard, Jr. aboard the Freedom 7 capsule. Shepard successfully became America's first man in space, making a brief but historic suborbital test flight that propelled American astronauts into the space race of the 1960s. NASA has compiled a video from from photographs taken by a film camera mounted to the Freedom 7 spacecraft. Compare the view in 1961 with the latest generation of space video we routinely receive from the ISS. Watch at: http://www.universetoday.com/95016/the-view-from-freedom-7/

+ Tom Doyle, W9KE posted a video demonstrating a feature he hoped to turn into a SatPC32 Add-On. It provides a "Look Down" perspective as if you were a passenger aboard the satellite. The video is HD and looks best viewed full screen in 720p. Watch it at: http://www.youtube.com/watch?v=g1K1sIw_F8Y

+ Check out the view of the Big Dipper from 290 million km away taken by NASA's Juno spacecraft en route to Jupiter: http://tinyurl.com/Juno-Big-Dipper (UniverseToday.com)

[ANS thanks everyone for the above information]

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information. And with that please keep in mind if you were to take all of the water on Earth, all of the fresh water, sea water, ground water, water vapor and water inside our bodies, take all of it and somehow collect it into a single, giant sphere of liquid, it would make a ball 860 miles (1,385 km) in diameter, only about as wide edge-to-edge as the distance between Salt Lake City to Topeka, Kansas. That's it.

73,
This week's ANS Editor,
JoAnne Maenpaa, K9JKM